Asteroid Astrometry from CCD Images

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Abstract

In this experiment, we——

1. Introduction

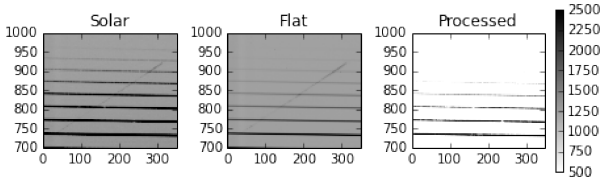

Figure 1: Both continuous sources shows the same artifact in a corner of the CCD image. The figures below are zoomed in — on this feature, which possibly from the reflected light . The halogen exposure is used for flat correction. Along with subtracting the background from the non-incident solar spectrum, the artifact is removed in the proceessed image shown in the rightmost figure.

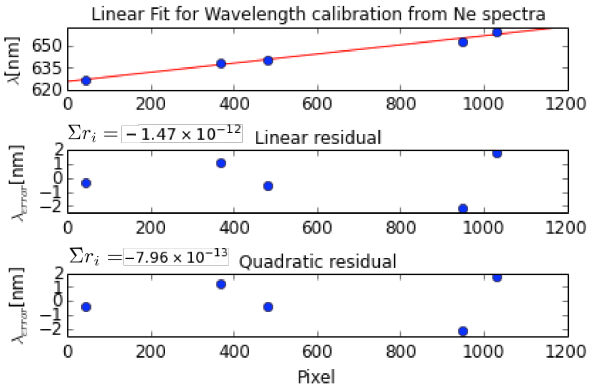

Figure 2: The first order fit in the top figure shows that the dispersion is approximately linear ($\frac{d\lambda}{d\text{pixel}}$=0.0315 nm/pixel). Since there is no notable pattern in linear residual, and the magnitude of the residual is small. From the bottommost quadratic figure, we see that the residual decrease by an order of magnitude.

2. Wavelength Calibration

We dark subtract the image

3. Doppler Shift Determination

4. Conclusion

References

- Howell, Steve, *Handbook of CCD Astronomy*, 2nd Edition. Cambridge University Press, 2006.
- Chromey, Frederick R. *To Measure the Sky: An Introduction to Observational Astronomy*. Cambridge: Cambridge UP, 2010. Print.
- Stewart, James. *Calculus: Early Transcendentals*. 7th ed. Belmont: Thomson/Brooks/Cole, 2003. Print.
- Perryman, M.A.C. and Lindegren, L. and Kovalevsky, J. and Hoeg, E. and Bastian, U. and Bernacca, P. L. and Crézé, M. and Donati, F. and Grenon, M. and Grewing, M. and van Leeuwen, F. and van der Marel, H. and Mignard, F. and Murray, C.A. and Le Poole, R.S. and Schrijver,

H. and Turon, C. and Arenou, F. and Froeschlé, M. and Petersen, C.S.. The HIPPARCOS Catalogue. . p. L49-L52 1997

- Lindegren, L. and Babusiaux, C. and Bailer-Jones, C. and Bastian, U. and Brown, A.G.A. and Cropper, M. and Hog, E. and Jordi, C. and Katz, D. and van Leeuwen, F. and Luri, X. and Mignard, F. and de Bruijne, J.H. J. and Prusti, T.. The Gaia mission: science, organization and present status. . p. 217-223 2008